PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference EC/BEC/S3623-0041	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/GB2004/002744	International filing date *(day/month/year)* 25.06.2004	Priority date *(day/month/year)* 14.11.2003
International Patent Classification (IPC) or national classification and IPC INV. B65D5/74		
Applicant BAPCO CLOSURES RESEARCH LTD et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 5 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in celectronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☒	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
01.06.2005	30.03.2006
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Bevilacqua, V Telephone No. +49 89 2399-7983

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2004/002744

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-3, 7-11	as originally filed
4-6	received on 03.06.2005 with letter of 01.06.2005

Claims, Numbers

1-12	received on 03.06.2005 with letter of 01.06.2005

Drawings, Sheets

1/2, 2/2	as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. IV Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees, the applicant has:
   - ☐ restricted the claims.
   - ☐ paid additional fees.
   - ☐ paid additional fees under protest.
   - ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

   see separate sheet

4. Consequently, this report has been established in respect of the following parts of the international application:

   ☒ all parts.

   ☐ the parts relating to claims Nos. .

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	4,10,12
	No:	Claims	1,2,3,5,6,7,8,9,11,
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

2. Citations and explanations (Rule 70.7):

   see separate sheet

Re Item IV
Lack of unity of invention

This Authority considers that there are 2 inventions covered by the claims indicated as follows:

I: Claim 1 and claims dependent from claim 1 directed to the use of a coated aluminium foil for its advantageous properties over the foil disclosed in D1
II: Claims 4,10 and 12 directed to an alternative solution of the problem, already solved in D1 of assembling the foil to the flange in such a way that the edge is prevented from coming into contact with the contents of the container.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The following technical features make a contribution over the prior art (D1) and can be considered as special technical features within the meaning of Rule 13.2 PCT:

-the foil is a coated aluminium foil (claim 1); the problem solved by this special technical feature can be construed as how to provide an alternative to the foil of D1 having better mechanical properties

- the barrier foil is wrapped over the first surface of the flange such that the foil extends also onto the opposite surface surrounding the spout (claim 4)
-a receiving wall is folded over the exposed foil edge (claim 10)
-the foil is wrapped over a first surface of the base flange (claim 12)
the problem to be solved by these special technical features may be regarded as how to prevent the edge of the foil from coming into contact with the contents of the container in a way different from the one disclosed in D1.
Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

In conclusion, the groups of claims are not linked by common or corresponding special technical features and define 2 different inventions not linked by a single general inventive concept.
The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

Re Item V.

1 The following documents are referred to in this communication:

D1: PATENT ABSTRACTS OF JAPAN vol. 2003, no. 03, 5 May 2003 (2003-05-05) & JP 2002 332054 A (KUREHA CHEM IND CO LTD), 22 November 2002 (2002-11-22)

2 Document D1 discloses (the references in parenthesis applying to this document see figures 3-5):
- a fitment comprising a base flange and a hollow spout, a removable part within a base of the spout and an overcap for resealably closing the spout and a barrier foil (26' see figure 3) coated on both sides with a plastic layer (34) extending across the base flange whereby the foil has a exposed cut edge prior to assembly in the fitment and that the edge is prevented in use from coming into contact with contents of a container to which the fitment is assembled

-a paperboard carton with this fitment inserte ino a pre-cut hole
-a method of manufacturing a fitment comprising the steps of placing a foil having a plastics layer on each surface within a receiving wall projecting from a first surface of a base flange of a fitment that has a hollow spout extending from an opposite surface and welding the foil to the flange such that the wall is sealed over the edge of the foil

2.1 INDEPENDENT CLAIM 1
As can be seen from the above, document D1 discloses a fitment from which the subject matter fof claim 1 differs in that the foil is a coated aluminium foil.
An aluminium foil is disclosed in D1 as a possible, non preferred embodiment of the barrier foil.
An aluminium foil has reduced gas barrier function but better mechanical properties than

the foil disclosed in D1 which is formed by metal deposition onto a plastic film.
The problem is how to provide a more robust sealing.
The solution to this problem is not considered to involve an inventive step because It is generally known to the person skilled in the art that aluminium foil can be used as a sealing film and can be interchanged with the film of D1 where circumstances make it desirable.

2.2 DEPENDENT CLAIMS 2, 3,5

Dependent claims 2, 3,5,6 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(2) and (3) PCT) because in D1 the cut edge is embedded in the base flange (claim 2) and the foil is sealed to the base flange (claim 3), and comprises tamper evident means (22,24, claim 5), where said fitment is inserted into a re-cut hole of a paperboard carton (claim 6 see figure 1).

2.3 INDEPENDENT CLAIM 7

In view of the above document D1, the subject-matter of independent claim 7 can not be considered inventive (Article 33(3) PCT) because the fitment used is not inventive (see point 2.1 of this communication) and a barrier coated metal container is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to select a possible container.

2.5 INDEPENDENT CLAIM 8

In view of the above document D1, the subject-matter of independent claim 8 can not be considered inventive (Article 33(3) PCT) because the fitment used is not inventive (see point 2.1 of this communication) and a mono layer plastics container is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to select a possible container.

2.6 INDEPENDENT CLAIM 9

As can be seen from the above, document D1 discloses a method from which the subject matter of claim 9 differs in that the foil used is an aluminium foil having a plastics layer on

each surface.
As already discusse for claim 1 the skilled person would interchange this aluminium film with the film of D1 where circumstances make it desirable.
claim 9 is therefore considered to lack an inventive step (Art 33(3) PCT).

2.7 DEPENDENT CLAIM 11

Dependent claim 11 apparently does not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of or inventive step (Article 33(2) and (3) PCT).

3 INDEPENDENT CLAIM 4, DEPENDENT CLAIM 10, INDEPENDENT CLAIM 11

D1 discloses a fitmentand a method from which the subject-matter of independent claims 4 and 12 and of dependent claim 10 differs in that
- the barrier foil is wrapped over the first surface of the flange such that the foil extends also onto the opposite surface surrounding the spout (claim 4)
-a receiving wall is folded over the exposed foil edge (claim 10)
-the foil is wrapped over a first surface of the base flange (claim 12)

The problem to be solved by the present invention as defined in claims 4,10 and 12 may be regarded as how to prevent the edge of the foil from coming into contact with the contents of the container.

The solutions to this problem proposed in claim 4,10 and 12 of the present application are all considered as involving an inventive step (Article 33(3) PCT) because none of the documents cited in the search report suggest these ways of solving this problem, the skilled person would therefore not come to this solution of the staed problem without the exercise of an inventive step.

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blank. Typically to create such seams, an inner paperboard layer is folded outwardly and overlapped with an outer layer so that the edges of the barrier layer foil are prevented from coming into contact with the contents. The seam is welded by ultrasound or induction heat sealed. This is found to produce acceptable results.

Applying a removable, peelable foil seal across a top of a fitment spout prevents the presence of a plug inside the overcap for satisfactory reseal and leaves a significant breach in the gas barrier through the base flange surrounding the spout within the hole and the spout wall.

It is therefore preferable to continue the barrier layer in the base flange of the fitment and this is a solution described in US4,948,015 (Kawajiri). The fitment described in has a base flange provided with a recess into which a thin film having a property of a gas barrier is securely fitted. It is suggested that the film may be of laminated structure comprising polyethylene, aluminium and polyethylene layers. The barrier layer has its peripheral edge concealed by the material of the film. Insert moulding is suggested as a technique for joining the film to the fitment. In principle the Kawajiri proposal solves the technical problems discussed above. However the design is not practicable for the following reasons:

- Practical, high volume, low cost manufacture of multilayer films containing an entirely embedded aluminium foil layer (with no exposed aluminium edge) is not known in the art and no method is described by Kawajiri.

- Insert moulding for such lightweight foil discs would be a slow procedure requiring careful placement of discs into the mould.

- In order to place the disc into the recess it is almost inevitable that a crevice would be created within the recess around the disc and this would render the fitment unsuitable for aseptic use as the crevice could not be adequately sterilised prior to use. The inability to kill bacteria hiding in crevices is a major issue that leads to any packaging subject to this problem being non aseptic, leading to a product "shelf life" of a few days, rather than the current aseptic norm of many months

shelf life under non refridgerated conditions.

Patent Abstracts of Japan vol 2003 & JP 2002 332054A (Kureha) relates to a similar fitment in which a gas barrier film is of a laminated structure with a barrier layer formed by metal deposition onto a plastic film. There is no indication that the cut edge of the barrier layer has its peripheral edge concealed from contact with the contents of the container. As there is no aluminium cut edge, the problem of preventing the edge from coming into contact with the contents of the container does not arise. Kureha further teaches the use of aluminium as a technical problem in its own right.

In accordance with the present invention the technical problems left unsolved by both Kawajiri and Kureha are solved by providing a fitment comprising a base flange and a hollow spout, a removable part within a base of the spout, and an overcap for resealably closing the spout, and a barrier foil coated on both sides with a plastics layer extending across the base flange, characterised in that the foil is a coated alumimium foil that has an exposed aluminium cut edge prior to assembly in the fitment, and that the edge of the foil is assembled to the flange in such a manner that the aluminium cut edge is prevented in use from coming into contact with contents of a container to which the fitment is assembled with the base flange inside the container. The edge can be sealed away in various ways such as, for example, by embedding it into the plastic of the flange, folding it underneath prior to sealing to the flange, or wrapping it around a peripheral edge of the flange.

Preferably the aluminium cut edge of the foil is embedded in the base flange. By embedding the cut edge of the aluminium foil into the plastic it cannot taint the product. Since the barrier layer in the paperboard carton overlaps with the barrier foil applied to the base flange there is no break in the barrier layer.

Such a fitment can be manufactured by a method comprising the steps of placing an aluminium foil having a plastics layer on each surface within a receiving wall projecting from a first surface of a base flange of a fitment that has a hollow spout extending from an opposite surface, and securing the foil to the flange such that the

wall is sealed over an aluminium cut edge of the foil disc.

The fully assembled fitment may be inserted into a pre-cut hole in a composite paperboard carton blank from inside prior to filling and the embedding of the foil edge carried out as part of the same process as welding the flange to the paperboard.

Alternatively the present invention provides a fitment comprising a base flange having a first surface and a hollow spout projecting from a surface opposite the first surface, a removable part within a base of the spout, and an overcap for resealably closing the spout, characterised in that a barrier foil coated on both sides with a plastics layer is

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Claims

1. A fitment comprising a base flange (4) and a hollow spout (6), a removable part (10) within a base of the spout (6), and an overcap (8) for resealably closing the spout (6), and a barrier foil (30) coated on both sides with a plastics layer extending across the base flange (4), characterised in that the foil (30) is a coated aluminium foil that has an exposed aluminium cut edge prior to assembly in the fitment, and that the edge of the foil (30) is assembled to the flange (4) in such a manner that the aluminium cut edge is prevented in use from coming into contact with contents of a container to which the fitment is assembled with the base flange inside the container.

2. A fitment as claimed in claim 1, characterised in that the aluminium cut edge of the foil (30) is embedded in the base flange (4).

3. A fitment as claimed in claim 1 or 2, characterised in that the foil (30) is sealed to the base flange (4).

4. A fitment comprising a base flange (4) having a first surface (54) and a hollow spout (6) projecting from a surface (56) opposite the first surface (54), a removable part (10) within a base of the spout (6), and an overcap (8) for resealably closing the spout, characterised in that a barrier foil (30) coated on both sides with a plastics layer is wrapped over the first surface of the flange (4) such that the foil extends onto the opposite surface (56) surrounding the spout.

5. A fitment as claimed in any one of the preceding claims, further comprising tamper evident means.

6. A paperboard carton with a fitment (2) as claimed in any one of the preceding claims inserted into a pre-cut hole (20) in a composite paperboard wall (22), characterised in that a seal between edges of the foil (30) and the wall (22) are of the same integrity as other seams in a remainder of the carton.

7. A plastic coated or barrier coated metal container with a fitment (2) as claimed in any one of the preceding claims inserted into a pre-cut hole (20) in a wall of the

container, characterised in that a seal between edges of the foil (30) and the wall are of the same integrity as other seams in a remainder of the container.

8. A mono or multi-layer plastics container which is thermoformed, injection moulded, or blow moulded, with a fitment (2) as claimed in any one of the preceding claims inserted into a pre-cut hole (20) in a wall of the container, characterised in that a seal between edges of the foil (30) and the wall are of the same integrity as other seams in a remainder of the container.

9. A method of manufacturing a fitment comprising the steps of placing an aluminium foil having a plastics layer on each surface within a receiving wall projecting from a first surface of a base flange of a fitment that has a hollow spout extending from an opposite surface, and welding the foil to the flange such that the wall is sealed over an aluminium cut edge of the foil.

10. A method as claimed in claim 9, further comprising the step of folding the receiving wall over the edge of the foil prior to the securing step.

11. A method as claimed in claim 9 or 10, wherein the securing step is carried out by induction heat sealing.

12. A method of manufacturing a fitment comprising the steps of wrapping a foil having a plastics layer on each surface over a first surface of a base flange of a fitment that has a hollow spout extending from an opposite surface such that the foil extends onto the opposite surface surrounding the spout, and welding the foil to the flange.